



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,360	08/01/2003	Yoshikatsu Itoh	542-015.002	3983

4955 7590 08/22/2005

WARE FRESSOLA VAN DER SLUYS &  
ADOLPHSON, LLP  
BRADFORD GREEN BUILDING 5  
755 MAIN STREET, P O BOX 224  
MONROE, CT 06468

EXAMINER

BERMAN, SUSAN W

ART UNIT PAPER NUMBER

1711

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/632,360

Applicant(s)

ITOH ET AL.

Examiner

Susan W. Berman

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Response to Amendment***

The objections to the disclosure and claims are withdrawn since “origomer” is replaced with “oligomer”.

The rejections of claims under 35 U.S.C. 102(e) as being anticipated by Ylitalo et al (6,558,753, filed 11/09/2000), Erikson et al (H1517), Murphy et al (6,040,347) or Yurugi et al (6,767,980) are withdrawn. The references do not teach ink jet ink compositions having the Tg requirements set forth in amended claim 1 or the viscosity requirement of claim 3.

***Response to Arguments***

Ylitalo et al: The rejection of claims as being anticipated is withdrawn. Applicant’s argument that Ylitalo et al fail to teach the claimed Tg range for one or more oligo/resins as well as the difference in Tg between the reactive diluent and the oligomer and/or prepolymer set forth in claim 1 is persuasive. Although Ylitalo et al teach elements of the instantly claimed invention, the reference does not provide motivation to select components for the disclosed compositions having properties as set forth in the instant claims. Ylitalo et al disclose acrylated urethane and acrylated polyester oligomers, but do not mention the Tg values. Ylitalo et al disclose that preferred reactive diluents have a “high Tg” such as at least about 50<sup>0</sup>C , preferably at least about 60<sup>0</sup>C, both teachings within the instantly claimed range. It is agreed that the more preferable Tg at least about 75<sup>0</sup>C is outside the limitations of instant claim 1. Applicant points out that the examples in the instant invention disclose acrylated urethanes having a Tg of 14<sup>0</sup> C (Example 1) and -37<sup>0</sup>C (comparative example 1). It is noted that Example 3 discloses a urethane acrylate with Tg 22<sup>0</sup>C and Example 4 a Tg of -27<sup>0</sup>C. It is noted that the urethane acrylates having negative Tg values are excluded from instant claim 1 and that the Tg of -37<sup>0</sup>C is in a comparative example. It is also noted that the urethane acrylates used by applicant are not the same as the urethane acrylates employed by Ylitalo et al; so this information does not disclose the Tg values of the

Art Unit: 1711

corresponding materials taught by Ylitalo et al. Applicant's argument concerning the difference in Tg being at least 36°C calculated from the Tg's of urethane acrylates disclosed by applicant and the Tg of the high Tg reactive diluents disclosed by Ylitalo et al is not persuasive because applicant employed the Tg values of acrylated urethanes different from those disclosed by Ylitalo et al in the calculations. The argument that Ylitalo et al employ a solvent in the disclosed compositions is not persuasive because the comprising language of the instant claim encompasses compositions comprising a solvent.

Yurugi et al: Applicant argues that Yurugi et al teach that the reactive diluent is used in a curable resin having a viscosity range preferably from 0.5 cps to 100,000 cps at 25°C. It is noted that Yurugi et al disclose that the curable resin composition comprising the reactive diluent and a curable resin (macromer or prepolymer) having a viscosity from 1.5 Pa.s at 25°C to not higher than 100,000 Pa.s at 80°C (column 16, lines 40-58). However, applicant's argument that Yurugi et al teach that an ink jet ink composition should have a viscosity of 1.2 cps to 50 cps at 25°C is persuasive with respect to lack of anticipation of the instant claims. However, the rejection is restated under 35 USC 103(a) herein below.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "each polymer of said reactive oligomer and/or reactive prepolymer and said reactive diluent... has a glass transition point between 0° and 70°C" in claim 1 renders the claims indefinite. The phrase "and/or reactive prepolymer and said reactive diluent" suggests that the Tg is (1) the Tg of a polymer obtained by polymerizing an oligomer (2) the Tg of a polymer obtained by polymerizing a prepolymer (3) the Tg of a polymer obtained by polymerizing an oligomer and a prepolymer, or (4) the

Art Unit: 1711

Tg of a polymer obtained by polymerizing the reactive diluent with the oligomer or prepolymer. It is believed that applicant intends to set forth the Tg of a polymer obtained by polymerizing (1) the reactive oligomer or (2) the reactive prepolymer or (3) the reactive diluent. It is suggested that the phrase should read "or said reactive prepolymer" and "or said reactive diluent". In claim 6, it is not clear whether applicant intends to claim heating to a temperature between 40<sup>0</sup> C and 150<sup>0</sup> C or to heat the ink "to 40<sup>0</sup>" C and then "to 150<sup>0</sup> C".

***Claim Rejections - 35 USC § 103(a)***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yurugi et al (6,767,980, filed 04-19-2002) in view of Ylitalo et al (6,558,753). Yurugi et al disclose compositions useful for inks comprising a reactive diluent composition comprising a vinyl ether group-containing (meth)acrylate and a hydroxy group-containing polymerizable compound and having a viscosity from 0.1 mPa.s to 1500 mPa.s at 25<sup>0</sup> C (Abstract and column 4, lines 43-59). The reactive diluent is used in compositions comprising a curable resin, such as a macromonomer or prepolymer having a polymerizable group, and a viscosity between 1.5 Pa.s at 25<sup>0</sup> C and 100,000 Pa.s at 80<sup>0</sup> C (column 16, lines 28-58). The viscosity of the composition (resin and reactive diluent) is preferably 0.5 mPa.s to 100,000 mPa.s at 25<sup>0</sup> C (column 18, lines 54-61). Photoinitiators are taught in column 22, lines 55-67. Ink jet printing and cure by irradiation is disclosed in column 25, line 63, to column 26, line 24. Yurugi et al teach that if the viscosity exceeds 50 mPa.s discharging characteristics may deteriorate even if the print head is provided with a mechanism such as heating to reduce the viscosity (column 28, lines 1-6). Yurugi et al disclose ink jet compositions wherein the viscosity is within the instantly claimed range of 60 to 800 cps at 25<sup>0</sup> C and compositions wherein the macromonomer or prepolymer having a polymerizable group would be

Art Unit: 1711

expected to have a viscosity within the instantly claimed 40 to 10000 cps at 60°C. With respect to claim 5, Yurugi et al teach ink jet ink compositions comprising 10 to 98% reactive diluent and thus 90 to 10 % resin (column 26, lines 18-24).

Ylitalo et al disclose ink jet ink compositions comprising acrylate-functional oligo/resins and reactive diluent monomers. Ylitalo et al teach that ink jet ink compositions preferably have a viscosity below about 30 cps at the desired ink jetting temperature (from ambient temperature up to about 65°C). Ylitalo et al also teach that optimum viscosity characteristics for a composition depend upon the jetting temperature and the type of ink jetting system that will be used to apply the composition to a substrate. See column 6, lines 5-34.

The difference between the instant claims and the disclosure of Yurugi et al is that Yurugi et al teach that curable ink compositions for ink jet printing preferably have a viscosity at 25°C between 1.2 mPa.s and 50 mPa.s, while applicant claims compositions having a viscosity of 60 to 800 cps at 25°C. However, It would have been obvious to one skilled in the art at the time of the invention to provide ink jet ink compositions comprising the components taught by Yurugi et al and having a viscosity greater than 50 mPa.s when using a printhead mechanism that heats the composition to a viscosity suitable for ink jet printing, as taught by Ylitalo et al in analogous art. Yurugi et al provide motivation by teaching that if the viscosity exceeds 50 mPa.s discharging characteristics may deteriorate even if the print head is provided with a mechanism such as heating to reduce the viscosity, thus suggesting that heating reduces viscosity and can therefore be used to discharge the compositions by ink jet printing mechanisms.

With respect to claim 6, Yurugi et al teach ink jet printing but do not specifically teach heating the composition to a temperature between 40°C and 150°C and applying the heated ink to the recording medium. It would have been obvious to one skilled in the art at the time of the invention to heat the compositions suggested by the disclosure of Yurugi et al for ink jet printing in order to provide a useful ink jet printing viscosity, as taught by Ylitalo et al in analogous art. Yurugi et al provide motivation by

Art Unit: 1711

teaching that print heads with a mechanism for heating to reduce viscosity are known in the art. Ylitalo et al provide motivation by teaching that ink jet ink compositions preferably have a viscosity below about 30 cps at the desired ink jetting temperature (from ambient temperature up to about 65°C).

*Allowable Subject Matter*

Claim 1 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action. Although Ylitalo et al teach elements of the instantly claimed invention, the reference does not provide motivation to select components for the disclosed compositions having properties as set forth in the instant claims.

*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 1711

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan W Berman whose telephone number is 571 272 1067. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571 272 1078. The fax phone number for the organization where this application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Susan W Berman  
Primary Examiner  
Art Unit 1711

SB  
8/17/05